IN THE CLAIMS

1.(Currently Amended) A permanent magnet type rotary electric machine of reduced cogging torque, said machine having a permanent magnet element comprised of a plurality of permanent magnets of alternate polarity in a circumferential direction, said permanent magnets being of substantially the same shape and disposed circumferentially at equal intervals with equal gaps therebetween, an armature element juxtaposed to said permanent magnet element and having a number of circumferentially spaced core teeth around which coils are wound, said core teeth defining a number N of slots therebetween, said permanent magnet element and said armature element being supported for relative rotation, the circumferential magnet angle made by each of said permanent magnets with respect to the axis of relative rotation producing a cogging number that is an integral multiple substantially greater than the least common multiple of the number of slots S and the number of poles P.

2. (Original) A permanent magnet type rotary electric machine as set forth in claim 1, wherein the cogging number is at least twice the least common multiple of the number of slots S and the number of poles P.

3. (Original) A permanent magnet type rotary electric machine as set forth in claim 2, wherein the magnitudes of torque exerted on the permanent magnets of N and S poles of the rotor are selected so that both of the torque values substantially cancel each other.

4. (Original) A permanent magnet type rotary electric machine as set forth in claim 2, wherein the number of poles P of the permanent magnet element is an even number no smaller than four and the number of slots S is not a multiple of P.

5. (Currently Amended) A permanent magnet type rotary electric machine as set forth in claim 1, wherein the rotary electric device is comprising a DC motor of reduced cogging torque, said motor having a permanent magnet element comprised of a plurality of permanent magnets of alternate polarity in a circumferential direction, said permanent magnets being of substantially the same shape and disposed circumferentially at equal intervals, an armature element juxtaposed to said permanent magnet element and having a number of circumferentially spaced core teeth around which coils are wound, said core teeth defining a number N of slots therebetween, said permanent magnet element and said armature element being supported for relative rotation, the circumferential magnet angle made by each of said permanent magnets with respect to the axis of relative rotation producing a cogging number that is an integral multiple substantially greater than the least common multiple of the number of slots S and the number of poles P, the number of slots S is eighteen and the number of poles P is four, and the magnet angle made by the said permanent magnets with respect to the axis of relative rotation is substantially equal to 67.5°.

6. (Original) A permanent magnet type rotary electric machine as set forth in claim 1, wherein the magnitudes of torque exerted on the permanent magnets of N and S poles of the rotor are selected so that both of the torque values substantially cancel each other.

7. (Currently Amended) A permanent magnet type rotary electric machine of reduced cogging torque, said machine having a permanent magnet element comprised of a plurality of permanent magnets of alternate polarity in a circumferential direction, said permanent magnets being of substantially the same shape and disposed circumferentially at equal intervals with equal gaps therebetween, an armature element juxtaposed to said permanent magnet element and having a number of circumferentially spaced core teeth around which coils are wound, said core teeth defining a number N of slots therebetween, said permanent magnet element and said armature element being supported for relative rotation, the magnitudes of torque exerted on the permanent magnets of N and S poles of the rotor are selected so that both of the torque values substantially cancel each other.

8. (Currently Amended) A permanent magnet type rotary electric machine as set forth in claim 7, wherein the rotary electric device is of reduced cogging torque comprising a DC motor, the number of slots S is eighteen and the number of poles P is four, having a permanent magnet element comprised of a plurality of permanent magnets of alternate polarity in a circumferential direction, said permanent magnets being of substantially the same shape and disposed circumferentially at equal intervals, an armature element juxtaposed to said permanent magnet element and having a number of circumferentially spaced core teeth around which coils are wound, said core teeth defining a number N of slots therebetween, said permanent magnet element and said armature element being supported for relative rotation, the magnitudes of torque exerted on the permanent magnets of N and S poles of the rotor are selected so that both of the torque values substantially cancel each other, and the magnet angle made by the said permanent magnets with respect to the axis of relative rotation is substantially equal to 67.5°.

9. (Currently Amended) A method of making a permanent magnet type rotary electric machine of reduced cogging torque, said method comprising the steps of constructing a permanent magnet element comprised of a plurality of permanent magnets of alternate polarity in a circumferential direction with the permanent magnets being of substantially the same shape and disposed circumferentially at equal intervals with equal gaps therebetween, juxtaposing an armature element to the permanent magnet element and having a number of circumferentially spaced core teeth around which coils are wound, the core teeth define a number N of slots therebetween, supported the permanent magnet element and the armature element for relative rotation, selecting the number of poles P of the permanent magnet element as an even number no smaller than four, selecting the number of slots S so that it is not a multiple of P, and selecting the circumferential magnet angle made by the permanent magnets with respect to the axis of relative rotation to produce a cogging number that is an integral multiple substantially greater than the least common multiple of the number of slots S and the number of poles P.

10. (Original) A method of making magnet type rotary electric machine as set forth in claim 9, wherein the cogging number is at least twice the least common multiple of the number of slots S and the number of poles P.

11. (Original) A method of making magnet type rotary electric machine as set forth in claim 10, wherein the magnitudes of torque exerted on the permanent magnets of N and S poles of the rotor are selected so that both of the torque values substantially cancel each other.

12. (Original) A method of making magnet type rotary electric machine as set forth in claim 10, wherein the number of poles P of the permanent magnet element is an even number no smaller than four and the number of slots S is not a multiple of P.

13. (Currently Amended) A method of making magnet type rotary electric machine as set forth in claim 9, wherein the rotary electric device is comprising a DC motor, the number of slots S is eighteen and the number of poles P is four, said method comprising the steps of constructing a permanent magnet element comprised of a plurality of permanent magnets of alternate polarity in a circumferential direction with the permanent magnets being of substantially the same shape and disposed circumferentially at equal intervals, juxtaposing an armature element to the permanent magnet element and having a number of circumferentially spaced core teeth around which coils are wound, the core teeth define a number N of slots therebetween, supported the permanent magnet element and the armature element for relative rotation, selecting the number of poles P of the permanent magnet element as an even number no smaller than four, selecting the number of slots S so that it is not a multiple of P, and selecting the circumferential magnet angle made by the permanent magnets with respect to the axis of relative rotation to produce a cogging number that is an integral multiple substantially greater than the least common multiple of the number of slots S and the number of poles P, and the magnet angle made by the permanent magnets with respect to the axis of relative rotation is substantially equal to 67.5°.

14. (Original) A method of making magnet type rotary electric machine as set forth in claim 9, wherein the magnitudes of torque exerted on the permanent magnets of N and S poles of the rotor are selected so that both of the torque values substantially cancel each other.

15. (Currently Amended) A method of making magnet type rotary electric machine of reduced cogging torque, said machine having a permanent magnet element comprised of a plurality of permanent magnets of alternate polarity in a circumferential direction, said permanent magnets being of substantially the same shape and disposed circumferentially at equal intervals with equal gaps therebetween, an armature element juxtaposed to said permanent magnet element and having a number of circumferentially spaced core teeth around which coils are wound, said core teeth defining a number N of slots therebetween, said permanent magnet element and said armature element being supported for relative rotation, the magnitudes of torque exerted on the permanent magnets of N and S poles of the rotor are selected so that both of the torque values substantially cancel each other.

16. (Currently Amended) A method of making magnet type rotary electric machine as set forth in claim 15, wherein the rotary electric device is comprising a DC motor, the number of slots S is eighteen and the number of poles P is four, having a permanent magnet element comprised of a plurality of permanent magnets of alternate polarity in a circumferential direction, said permanent magnets being of substantially the same shape and disposed circumferentially at equal intervals, an armature element juxtaposed to said permanent magnet element and having a number of circumferentially spaced core teeth around which coils are wound, said core teeth defining a number N of slots therebetween, said permanent magnet element and said armature element being supported for relative rotation, the magnitudes of torque exerted on the permanent magnets of N and S poles of the rotor are selected so that both of the torque values substantially cancel each other, and the magnet angle made by the permanent magnet with respect to the axis of relative rotation is being substantially equal to 67.5° .

17. (Original) A method of making magnet type rotary electric machine as set forth in claim 15, wherein the permanent magnet angle is arrived at from a computer simulation of the torques on the individual magnets.